

EOS Production Sites

Network Performance Report: April 2012

This is a monthly summary of EOS network performance testing between production sites -- comparing the measured performance against the requirements. **Significant improvements are noted in Green, Network problems in Red, System problems and Requirements issues in Gold, Issues in Orange, and other comments in Blue.**

Highlights:

- **Mostly stable flows**
 - **GPA 3.68** (same as last month).
- **Requirements:** updated to Handbook 1.4.3 in May '09 (was 1.4.2 previously)
 - Many Requirements dropped significantly (under review)
- **All EBnet Outflows:** Increased packet loss and reduced thruput started 29 February.
- **Only 2 flows below “Good”:**
 - GSFC MODAPS-PDR → EROS (“**Low**”)
 - GSFC GES DISC → JPL (“**Adequate**”)

Ratings Changes:

Upgrade: ↑ None

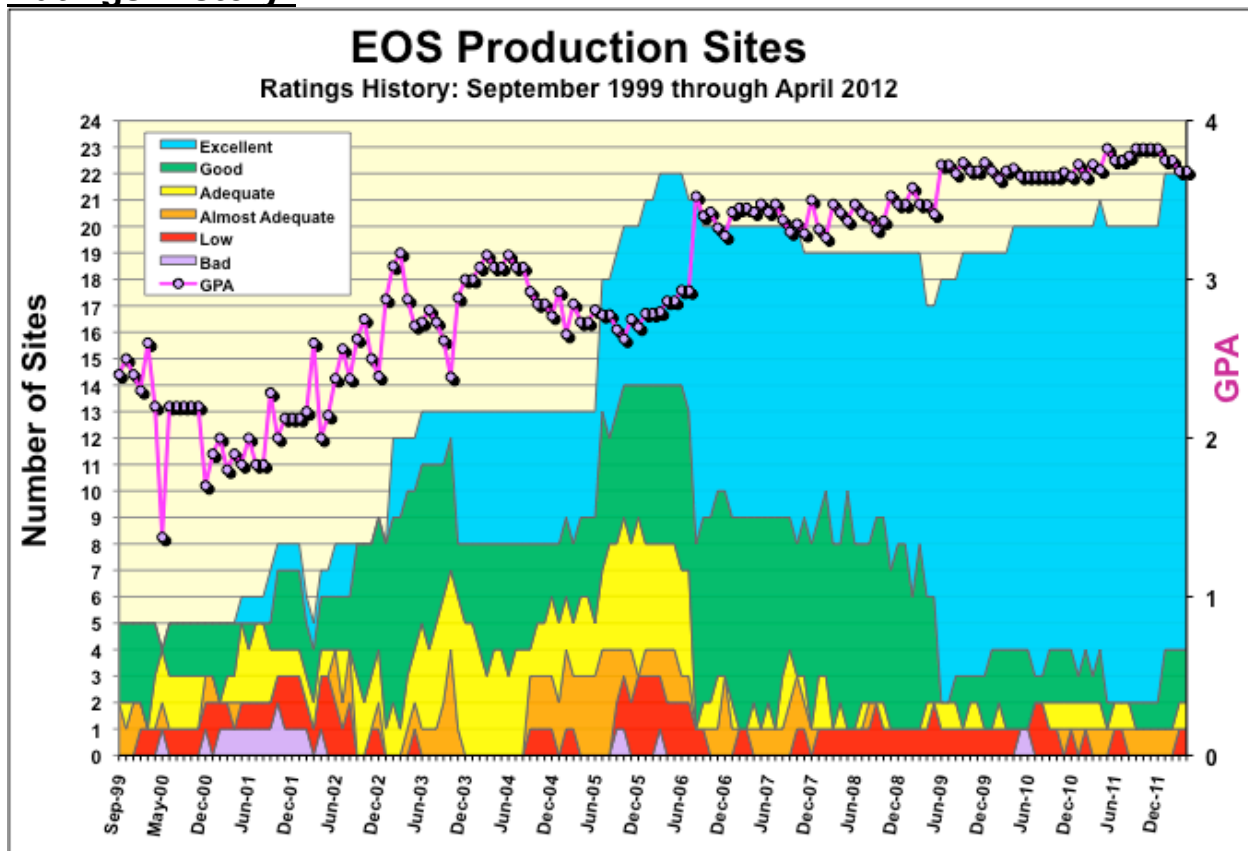
Downgrades: ↓ None

Ratings Categories:

Rating	Value	Criteria
Excellent:	4	Total Kbps > Requirement * 3
Good:	3	1.3 * Requirement <= Total Kbps < Requirement * 3
Adequate:	2	Requirement < Total Kbps < Requirement * 1.3
Almost Adequate:	1.5	Requirement / 1.5 < Total Kbps < Requirement
Low:	1	Requirement / 3 < Total Kbps < Requirement / 1.5
Bad:	0	Total Kbps < Requirement / 3

Where Total Kbps = Average Integrated Kbps (where available), otherwise just iperf

Note that “**Almost Adequate**” implies meeting the requirement except for the 50% contingency factor.

Ratings History:

The chart above shows the number of sites in each rating category since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance – they are relative to the EOS requirements.

Additions and deletions:

2011 April: Added RSS to GHRC
 2011 May: Deleted WSC to ASF for ALOS
 2012 January: NOAA → GSFC-SD3E
 GSFC-SD3E → Wisconsin

Requirements Basis:

While the long-term plan is to use the requirements from the EOSDIS network requirements database, the database does not appear ready to be used for that purpose at this time. ESDIS is in process of reviewing its network ICD's with each instrument team. When these ICDs are completed, the database will be updated with the ICD values, and those values will be used here as well.

Until then, the requirements are based on the EOS Networks Requirements Handbook, Version 1.4.3 (from which the original database requirements were derived). Previously, the requirements were derived from version 1.4.2.

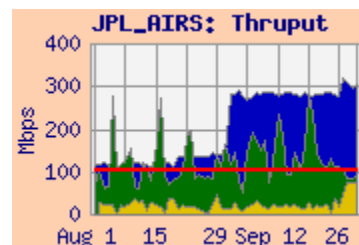
One main difference between Handbooks 1.4.2 and 1.4.3 is that most flows which occur less than once per day were averaged over their production period. These flows were typically monthly Level 3 data transfers, which were specified to be sent in just a few hours. However, they could easily be accommodated either between the per-orbit flows, or within the built-in contingency. Previously, these flows were added in linearly to the requirements, making the requirements unrealistically high.

Additionally, the contingency for reprocessing flows greater than 2X reprocessing was reduced. These flows WERE a major component of the contingency, so adding additional contingency on top of these flows was considered excessive.

However, it seems likely that there are some flows which have been omitted from version 1.4.3. For example, the GES DISC to KNMI requirement for Level 1+ data (without contingency) was 1.4 mbps in version 1.4.2, but only 22 kbps in version 1.4.3. The user flow has been averaging about 1.4 mbps, suggesting that version 1.4.2 was correct, and that version 1.4.3 has omitted something.

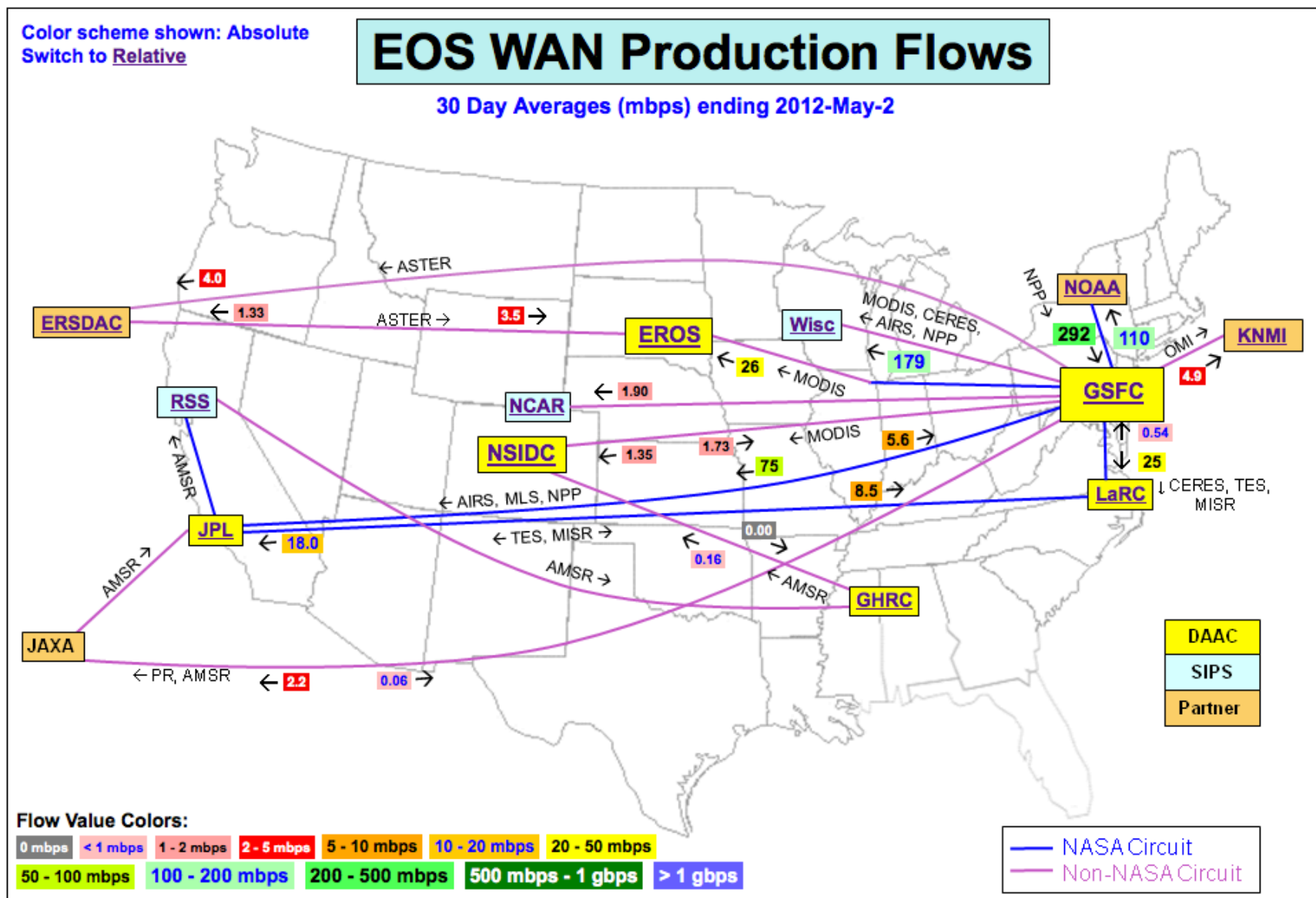
Integrated Charts:

Integrated charts are included with site details, where available. These charts are "Area" charts, with a "salmon" background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the destination facility (JPL, in this example) obtained from routers via "netflow". The green area is stacked on top of the user flow, and represents the "adjusted" daily average iperf throughput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. Adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities. On some charts a blue area is also present – usually "behind" the green area – representing adjusted iperf measurements from a second source node at the same facility.



Network Requirements vs. Measured Performance

April 2012		Requirements (mbps)		Testing				Ratings	
Source → Destination	Instrument (s)	Current	Old	Source → Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re HB 1.4.3+ Requirements	
		HB 1.4.3+	HB 1.4.2					This Month	Last Month
GSFC → EROS	MODIS, LandSat	342.9	345.9	MODAPS-PDR → EROS LPDAAC	28.4	200.5	207.7	Low	Low
GSFC → JPL	AIRS, MLS, NPP, ISTs	116.7	43.6	GSFC GES DISC → JPL-AIRS	64.8	117.3	146.9	Adequate	Ad
JPL → GSFC	MLS	0.6	7.4	JPL-PTH → GSFC-ESDIS-PTH	5.5	85.4	85.5	Excellent	Ex
JPL → RSS	AMSR-E	0.5	2.5	JPL-PODAAC → RSS (Comcast)		50.0		Excellent	Ex
RSS → GHRC	AMSR-E	0.3		RSS (Comcast) → GHRC		5.2		Excellent	Ex
LaRC → JPL	TES, MISR	69.3	43.7	LARC-ASDC → JPL-TES	14.7	331.2		Excellent	Ex
JPL → LaRC	TES	1.5	4.4	JPL-TES → LARC-PTH	8.4	203.8		Excellent	Ex
GSFC → LaRC	CERES, MISR, MOPITT	30.8	60.5	GES DISC → LaRC ASDC	24.2	422.9	423.1	Excellent	Ex
LaRC → GSFC	CERES, MODIS, TES	0.4	0.2	LARC-ASDC → GES DISC	0.50	402.2	402.2	Excellent	Ex
JPL → NSIDC	AMSR-E	0.2	1.3	JPL-PODAAC → NSIDC		302.6		Excellent	Ex
NSIDC → GSFC	MODIS, ICESAT, QuikScat	0.6	0.5	NSIDC DAAC → GES DISC	1.65	273.2	273.2	Excellent	Ex
GSFC → NSIDC	MODIS, ICESAT, QuikScat	27.6	34.5	GES DISC → NSIDC-DAAC	1.2	109.5	109.5	Excellent	Ex
GHRC → NSIDC	AMSR-E	0.5	7.5	GHRC → NSIDC DAAC (ftp)	0.16	11.4		Excellent	Ex
NOAA → GSFC	NPP	615.6	n/a	NOAA-PTH → GSFC NPP-SD3E OPS1	286.6	918.3	961.4	Good	Good
GSFC → WISC	NPP	253.7	n/a	GSFC NPP-SD3E OPS1 → WISC	178.1	274.8	333.7	Good	Good
LaRC → NCAR	MOPITT	0.1	5.4	LARC-ASDC → NCAR		161.1		Excellent	Ex
GSFC → LASP	ICESat, QuikScat	0.4	0.4	GES DISC → LASP (blue)	0.050	5.68		Excellent	Ex
GSFC → JAXA	QuikScat, TRMM, AMSR	0.1	2.0	GSFC → JAXA	2.2	Testing discontinued: 31 March 2009		Excellent	Ex
JAXA → GSFC	AMSR-E	0.1	1.3	JAXA → GSFC	0.06			Excellent	Ex
GSFC → ERSDAC	ASTER	5.4	12.5	GSFC-EDOS → ERSDAC	4.0	47.2	48.9	Excellent	Ex
ERSDAC → EROS	ASTER	8.3	26.8	ERSDAC → EROS PTH	3.7	95.9	96.3	Excellent	Ex
GSFC → KNMI	OMI	0.03	3.3	GSFC-OMISIPS → KNMI ODPS	4.8	36.2	37.7	Excellent	Ex
				Significant change from v 1.4.2 (5/09) to v 1.4.3					
				Value used for ratings					
*Criteria:	Excellent	Total Kbps > Requirement * 3				Ratings Summary			
	Good	1.3 * Requirement <= Total Kbps < Requirement * 3				HB 1.4.3+ Req			
	Adequate	Requirement < Total Kbps < Requirement * 1.3				Score			Prev
	Almost Adequate	Requirement / 1.5 < Total Kbps < Requirement				Excellent		18	18
	Low	Requirement / 3 < Total Kbps < Requirement / 1.5				Good		2	2
	Bad	Total Kbps < Requirement / 3				Adequate		1	1
						Almost Adequate		0	0
						Low		1	1
						Bad		0	0
						Total Sites		22	22
Notes:	Flow Requirements include: TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS, NPP					GPA		3.68	3.68



This new chart shows the averages for the main EOS production flows for the current month. Up to date flow information can be found at http://ensight.eos.nasa.gov/Weather/web/hourly/Production_Flows-A.shtml

EOS Production Flows
Measured Performance vs. Requirements

Top of Bars: Total Kbps (User Flow + IPPerf)
 Bottom of Bars: Average User Flow

← Top of bar here indicates throughput is "off the Chart"

"Excellent" if top of bar is above this line

"GOOD" if top is in this Region

"Adequate" region

"Almost Adequate" region

"LOW" if top is in this region

"BAD" if top is below this line

← Bottom of bar here indicates user flow data is not available

Production Flow	Performance Region (Top of Bar)
GSFC → EROS	LOW
GSFC → JPL	GOOD
JPL → GSFC	Excellent
RSS → RSS	Excellent
LaRC → GHRC	Excellent
JPL → JPL	Excellent
GSFC → LaRC	Excellent
LaRC → LaRC	Excellent
JPL → GSFC	Excellent
NSIDC → NSIDC	Excellent
GSFC → GSFC	Excellent
GHRC → NSIDC	GOOD
NOAA → NSIDC	GOOD
GSFC → GSFC	GOOD
LaRC → WISC	Excellent
GSFC → NCAR	Excellent
GSFC → LASP	Excellent
JAXA → JAXA	Excellent
GSFC → GSFC	Excellent
ERSDAC → ERSDAC	Excellent
GSFC → EROS	Excellent
GSFC → KNMI	Excellent

1) EROS:

Ratings: GSFC→ EROS: Continued **Low**
 ERSDAC→ EROS: Continued **Excellent**

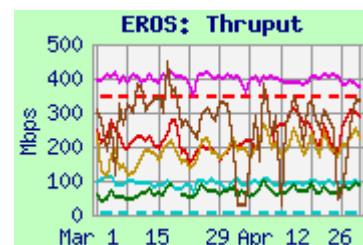
Web Page: <http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml>
http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → EROS LPDAAC	265.3	200.5	142.0	28.4	207.7
GSFC-EDOS → EROS LPDAAC	136.8	70.7	24.5		
GES DISC → EROS LPDAAC	323.4	253.2	129.2		
GSFC-ENPL → EROS LPDAAC	420.9	392.1	279.0		
ERSDAC → EROS LPDAAC	127.1	95.9	57.0	3.7	96.3
NSIDC SIDADS → EROS PTH	519.0	262.0	50.4		
GSFC-ENPL → EROS PTH	801.4	715.2	311.0		
GSFC-NISN → EROS PTH	558.0	364.3	186.0		
LaRC PTH → EROS PTH	187.7	142.6	72.0		

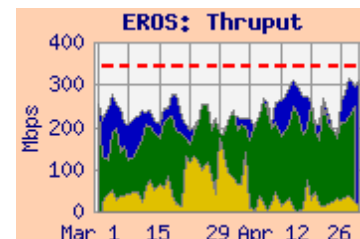
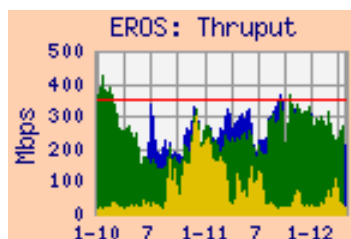
Requirements:

Source → Dest	Date	mbps	Rating
GSFC → EROS	CY '08 -	343	Low
ERSDAC → EROS	FY '06 -	8.3	Excellent

**Comments:**

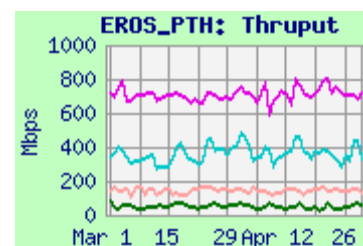
1.1 GSFC → EROS: The rating is based on the MODAPS-PDR Server to EROS LP DAAC measurement, since that is the primary flow. The route is via the Doors to NISN SIP, via the NISN 10 gbps backbone to the NISN Chicago CIEF, then via GigE to the StarLight Gigapop, peering there with the EROS OC-48 tail circuit.

The user flow dropped off in July '11, after about 8 months of high user flow, reportedly based on a science user at EROS acquiring MODIS data. This month it dropped closer to normal (was 68 mbps last month), and averaged only about 8% of the nominal requirement (the requirement includes MODIS reprocessing).



Due to packet loss on all flows leaving EBnet, the median integrated thrupt from MODAPS-PDR to LPDAAC is again below the requirement, even without the 50 % contingency factor, so the rating remains **Low**.

Iperf testing from GSFC-ENPL was added to LPDAAC in November '11, to compare with testing to EROS-PTH from this source. The GSFC-ENPL host has a direct connection to the MAX; its route is via MAX to Internet2 to StarLight in Chicago. GSFC-ENPL to EROS-PTH typically gets over 700 mbps, and shows the capacity of the network is well in excess of the requirement. Also, GSFC-ENPL to EROS LPDAAC is the best to LPDAAC, and would be rated "**Adequate**". The difference in performance from GSFC-ENPL to EROS-PTH vs LPDAAC is attributable to the extra firewalls at EROS. GSFC-ENPL to EROS PTH would be rated "**Good**".



1.2 ERSDAC → EROS: **Excellent**. See section 9 (ERSDAC) for further discussion.

1.3 NSIDC → EROS-PTH: Performance is very noisy, with a best:worst ratio over 10:1.

1.4 LaRC → EROS: The thrupt from LaRC-PTH to EROS-PTH was stable. The route is via NISN SIP to the Chicago CIEF to StarLight – similar to EBnet sources.

2) to GSFCRatings: NOAA → NPP SD3E: **Good**NSIDC → GES DISC: Continued **Excellent**LDAAC → GES DISC: Continued **Excellent**JPL → GSFC: Continued **Excellent**

Web Pages:

http://ensight.eos.nasa.gov/Missions/NPP/GSFC_SD3E.shtml<http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>http://ensight.eos.nasa.gov/Organizations/production/ESDIS_PTH.shtmlhttp://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
NOAA-PTH → NPP-SD3E-OPS1	938.3	918.3	796.3	286.6	961.4
EROS LPDAAC → GES DISC	221.9	193.8	127.1		
EROS PTH → GSFC-ESDIS PTH	427.2	283.8	168.4		
JPL-PTH → GSFC-ESDIS PTH	88.1	85.4	74.7	5.5	
JPL-TES → GSFC-NISN	604.7	206.1	30.1		
LaRC ASDC → GES DISC	515.2	402.2	204.2	0.5	
LARC-ANGe → GSFC-ESDIS PTH	497.2	425.7	350.5		
NSIDC DAAC → GES DISC	313.9	273.2	180.3	1.6	
NSIDC DAAC → GSFC-ISIPS	n/a	n/a	n/a		

Requirements:

Source → Dest	Date	Mbps	Rating
NSIDC → GSFC	CY '06 –	0.6	Excellent
LaRC ASDC → GES DISC	FY '07 –	0.4	Excellent
JPL → GSFC combined	CY '06 –	3.2	Excellent
NOAA → NPP SD3E	CY '06 –	615.6	Good

Comments:

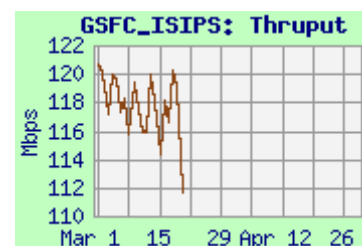
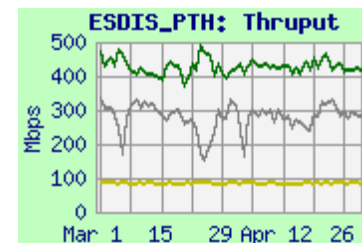
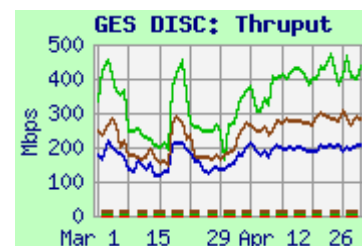
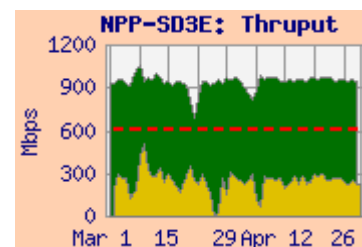
NOAA → NPP-SD3E: Performance from NOAA-PTH to GSFC NPP-SD3E-OPS1 was very steady at over 900 mbps, limited by the gig-E interfaces on the test machines (the circuits are all 10 gbps). User flow was about the same as last month, and close to expectations soon after NPP launch.

EROS, EROS-PTH → GSFC: The throughput for tests from EROS and EROS-PTH to GES DISC and ESDIS-PTH were mostly stable.

JPL → GSFC: Throughput from JPL-PTH was again very stable this month, limited by the Fast-E interface on JPL-PTH. With the modest requirement the rating remains “**Excellent**”. The actual user flow is above the reduced requirement. Testing from JPL-TES to GSFC-NISN (not graphed) more clearly shows the capability of the network.

LaRC → GSFC: Performance from LaRC ASDC to GES DISC and LaRC ANGe to ESDIS-PTH remained way above 3 x the modest requirement, so the rating continues as “**Excellent**”. The user flow this month was again above the requirement.

NSIDC → GSFC: Performance from NSIDC to GES DISC improved in mid December, after dropping in mid October, apparently due to switching routes at FRGP. The user flow was again above the low requirement (reduced from 13.3 mbps in May '09); the rating remains “**Excellent**”. Testing to GSFC-ISIPS is down after reconfiguration -- due to firewall blocking -- will try to restore.



2.2 GSFC-ECHO: EOS Metadata Clearinghouse

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfsc/GSFC_ECHO.shtml

Test Results:

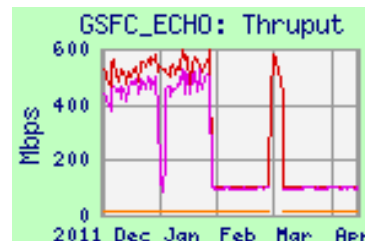
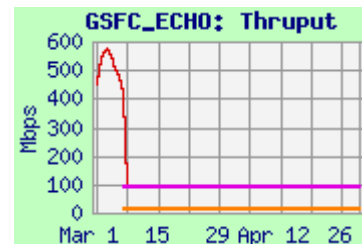
Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	n/a	n/a	n/a
EROS LPDAAC ftp	12.3	12.2	10.3
GES DISC	93.7	93.5	91.0
GES DISC ftp	93.0	92.5	80.8
LaRC ASDC DAAC	n/a	n/a	n/a
LaRC ASDC DAAC ftp	n/a	n/a	n/a
MODIS-LADSWEB	n/a	n/a	n/a
NSIDC DAAC	n/a	n/a	n/a
NSIDC DAAC ftp	11.3	11.3	10.2

Comments:

The echo node was moved at the end of September '11. Most ftp tests continued working (except from LaRC ASDC), but iperf tests need new firewall rules before resumption of testing. Iperf testing resumed from GES DISC in November, with excellent thruput.

In late January, however, thruput from GES DISC to ECHO dropped to just under 100 mbps, suggesting that a fast-E interface was in use. Performance returned to the higher state for the first week in March: iperf from GES DISC was back over 500 mbps, but the ftp stopped working during that period. Then, by March 7, the 100 mbps limitation was back – but the ftp tests from EROS and NSIDC started working again.

Ftp performance was stable from EROS and NSIDC. FTP performance is mostly limited by TCP window size – especially from sites with long RTT.

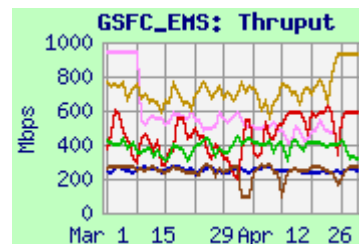


2.3 GSFC-EMS: EOS Metrics System

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfsc/GSFC_EMS.shtml

Test Results:

	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	271.4	248.1	194.7
ESDIS-PTH	625.9	493.8	401.1
GES DISC	619.7	554.1	78.4
LaRC ASDC	478.8	402.7	199.4
MODAPS-PDR	871.5	728.2	433.6
NSIDC-SIDADS	288.2	251.1	79.5



Comments:

Testing is performed to GSFC-EMS from the above nodes, iperf only. The EMS testing from ESDIS-PTH, GES DISC, and MODAPS-PDR was transitioned to the new test node (FS1) in November '11, with much improved thruput. NSIDC-SIDADS was transitioned in December, also with improved thruput. Testing from LaRC ASDC and EROS LPDAAC transitioned in January. The performance limitation to the old server was its 100 mbps Fast-E connection; the new server is gigabit connected.

3) JPL:

3.1) GSFC → JPL:

Ratings: GSFC → JPL: Continued **Adequate**

Web Pages: http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-GES DISC → JPL-AIRS	164.9	117.3	71.2	64.8	146.9
NPP-SD3E-OPS2 → JPL-AIRS	176.2	126.3	88.8		
GSFC-NISN → JPL-AIRS	199.3	187.0	155.0		
ESDIS-PTH → JPL-AIRS	214.2	158.6	104.8		
ESDIS-PTH → JPL-PODAAC	145.5	109.4	73.3		
GSFC-NISN → JPL-PODAAC	112.8	83.7	45.8		
MODAPS-PDR → JPL-PODAAC	61.2	46.3	30.9		
GSFC-NISN → JPL-QSCAT	74.2	70.0	56.9		
ESDIS-PS → JPL-QSCAT	52.6	34.5	21.3		
GSFC-NISN → JPL-MLS	210.9	158.8	62.0		
ESDIS-PTH → JPL-MLS	272.9	160.1	84.6		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	FY '08-	116.7	Adequate
GSFC → JPL AIRS	FY '08-	98	Good
GSFC NPP → JPL Sounder	FY '12 -	15	Excellent
GSFC → JPL PODAAC	FY '08-	1.5	Excellent
GSFC → JPL QSCAT	FY '08-	0.6	Excellent
GSFC → JPL MLS	FY '08-	2.1	Excellent

Comments: Due to EBnet outgoing packet loss, throughput from all EBnet sources (GES DISC, NPP-SD3E, ESDIS-PS, and ESDIS-PTH) dropped significantly on 29 February, compared with GSFC-NISN, which was stable.

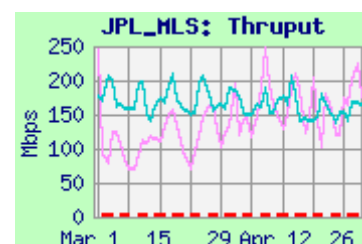
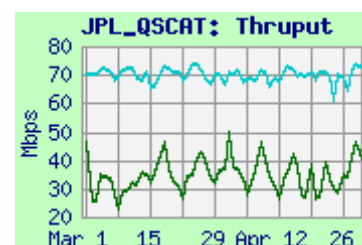
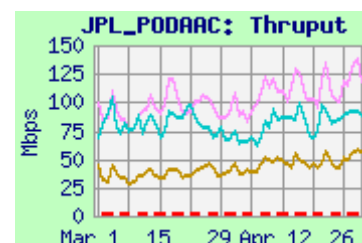
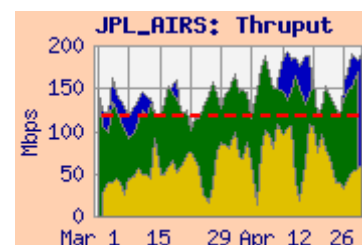
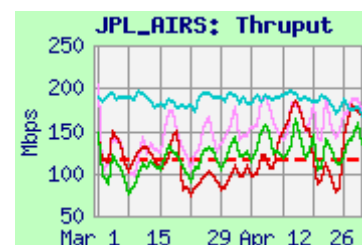
AIRS, Overall: Integrated throughput from GES DISC remained above the AIRS requirement, but now by more than 30%, so the AIRS rating improves to **Good**. The **JPL overall rating** is based on this test compared with the sum of all the GSFC to JPL requirements – the throughput is below 1.3 x this requirement, so the overall rating remains **Adequate**. As the AIRS integrated graph shows, total user flow from GSFC to JPL increased further (was 58 mbps last month, and 31 mbps previously).

NPP: Testing from SD3E-OPS2 is also to JPL-AIRS, as a proxy for JPL-Sounder PEATE. Throughput was comparable to other EBnet sources, well in excess of the requirement.

PODAAC: Testing to PODAAC was switched to the new node in May '11. Performance is way above the 1.5 mbps PODAAC requirement, rating **Excellent**.

QSCAT: Throughput from ESDIS-PS to QSCAT is noisy due to EBnet packet loss. (unlike from GSFC-NISN, which was more stable). It remains well above the modest requirement, rating **Excellent**.

MLS: Throughput from ESDIS-PTH is low due to EBnet packet loss. Throughput from GSFC-NISN was stable. Both were way above the modest requirement, so the rating remains **Excellent**.



3.2) LaRC → JPLRating: Continued **Excellent**

Web Pages:

http://ensight.eos.nasa.gov/Organizations/production/JPL_TES.shtmlhttp://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtmlhttp://ensight.eos.nasa.gov/Organizations/production/JPL_PTH.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
LaRC DAAC → JPL-TES	472.4	331.2	59.0	0.12	
LaRC PTH → JPL-TES	173.9	159.9	131.9		
LaRC PTH → JPL-TES sftp	26.5	25.7	14.4		
LaRC ANGE → JPL-PTH	77.9	75.2	69.2	14.7	
LaRC DAAC → JPL-MISR	76.8	73.2	32.7	5.0	73.2
LaRC PTH → JPL-MISR	76.2	71.9	39.1		

Requirements:

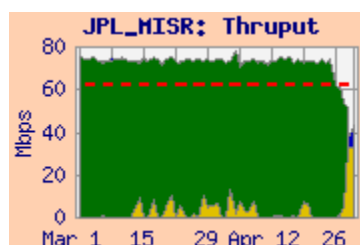
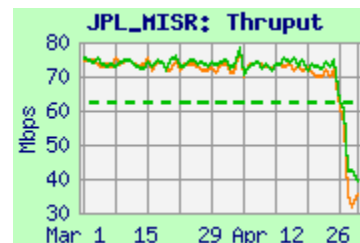
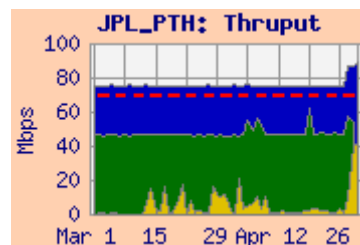
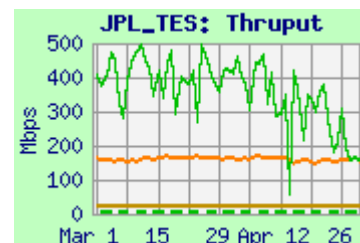
Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 –	7.0	Excellent
LaRC DAAC → JPL-MISR	FY '07 –	62.3	Adequate
LaRC → JPL-Combined	FY '07 –	69.3	Excellent

Note: The overall LaRC → JPL flow (14.7 mbps) was about double recent months. Only about 34% of the LaRC to JPL flow this month was for MISR (previously around 80%). The JPL-PTH integrated graph shows the overall LaRC to JPL user flow (vs. the overall requirement).

LaRC → JPL (Overall, TES): Median performance from LaRC ASDC DAAC to JPL-TES remains well over 3 x the TES and combined requirements, so the TES and Overall ratings remain **Excellent**. User flow to TES is very low.

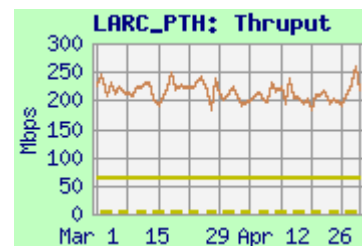
LaRC → JPL (MISR): The MISR node was replaced in mid October '11; testing was retuned mid January. The median throughput remains ABOVE the requirement, but by less than 30% (limited by a Fast-E connection to the MISR node), so the MISR rating remains **Adequate**. The average user flow to MISR was only about 8% of the new requirement. **There was an increase in user flow to about 40 mbps at the end of April.**

Note: Even though the LaRC → MISR rating is **Adequate**, the overall LaRC → JPL rating remains **Excellent**, since the MISR performance is limited by MISR's Fast-E interface. Its performance is therefore not representative of the overall LaRC → JPL capability.



3.3) JPL → LaRC**Rating: Continued Excellent**Web Page: http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow
	Best	Median	Worst	
JPL-PTH → LaRC PTH	63.2	63.0	62.9	8.4
JPL-TES → LaRC PTH	306.5	203.8	97.1	

**Requirements:**

Source → Dest	Date	Mbps	Rating
JPL → LaRC	FY '07 –	1.5	Excellent

Comment: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving; it was reduced from 4.4 mbps in May '09 (and had been reduced in April '08 from 52.6 mbps). This month the thrupt from JPL-PTH was again stable at the lower of its two common states – 63 and 85 mbps. The rating remains “Excellent”. The user flow was much higher than usual and the requirement this month.

Thruput from JPL-TES to LaRC-PTH is much higher than from JPL-PTH.

4) GSFC → LaRC:**Rating: Continued Excellent**

Web Pages : <http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml>
http://ensight.eos.nasa.gov/Organizations/production/LARC_ANGe.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES DISC → LaRC ASDC	522.3	422.9	208.8	24.2	423.1
GSFC-EDOS → LaRC ASDC	314.5	165.3	55.3		
ESDIS-PTH → LaRC-ANGe	414.5	357.6	274.8		
GSFC-NISN → LaTIS	500.1	458.7	288.7		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	CY '09 –	31.3	Excellent

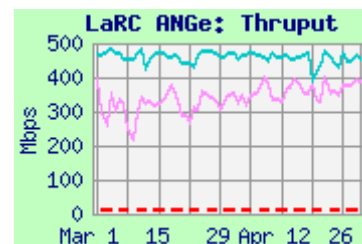
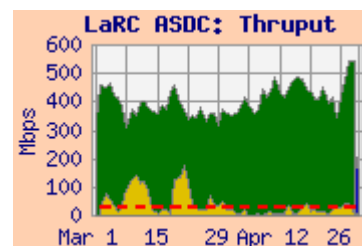
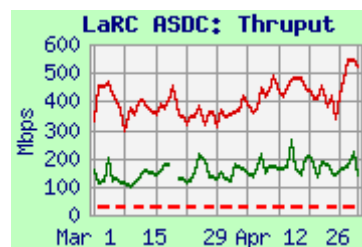
Comments: Due to EBnet outgoing packet loss, thrupt from all EBnet sources (GES DISC, EDOS, and ESDIS-PTH) dropped significantly on 29 February, vs. GSFC-NISN, which was stable. Note that packet loss does not have much effect on thrupt for these flows, due to the short RTT.

GSFC → LaRC ASDC: The rating is based on the GES DISC to LaRC ASDC DAAC thrupt, compared to the combined requirement. It remains well above 3 x this requirement, so the rating remains “Excellent”.

Thruput to ASDC from GSFC-EDOS was lower than from GES DISC.

As seen on the integrated graph, there were periods of high user flow exceeding the requirement in March – not seen this month.

ANGe (LaTIS): Testing to ANGe from ESDIS-PTH dropped due to EBnet packet loss. Testing to LaTIS (Darrin) from GSFC-NISN was similar, with very consistent results.



5) Boulder CO sites:

5.1) NSIDC:

Ratings: GSFC → NSIDC: Continued **Excellent**
 JPL → NSIDC: Continued **Excellent**
 GHRC → NSIDC: Continued **Excellent**

Web Pages: <http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml>
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_SIDADS.shtml
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_PTH.shtml

The NSIDC DAAC was disconnected from NISN PIP in December '09 – all flows now go via the UCB campus, usually via FRGP to Internet2 or NLR. Thus the DAAC competes with the students for network capacity, and there was often significant diurnal variation.

Test Results: NSIDC S4PA

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES-DISC → NSIDC DAAC	150.0	109.5	62.2	1.2	109.5
MODAPS-PDR → NSIDC DAAC	133.1	100.1	71.6		
GSFC-EDOS → NSIDC DAAC	66.6	35.1	13.0		
GSFC-ISIPS → NSIDC (iperf)	80.7	57.5	40.2		
JPL PODAAC → NSIDC DAAC	313.2	302.6	232.3		

Requirements:

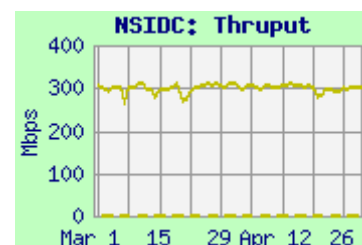
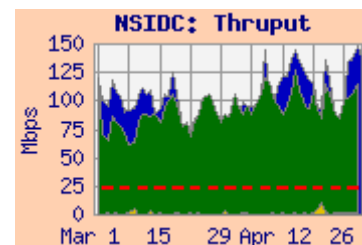
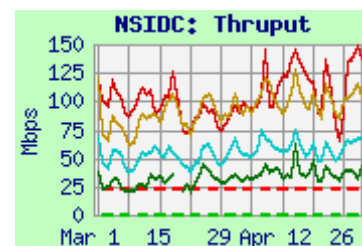
Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 –	27.6	Excellent
JPL → NSIDC	CY '07 –	0.2	Excellent
GHRC → NSIDC	CY '07 –	0.5	Excellent

Comments: GSFC → NSIDC S4PA: Due to EBnet outgoing packet loss, throughput from all EBnet sources dropped significantly on 29 February.

The rating is based on testing from the **GES DISC** server to the NSIDC DAAC. The requirement was reduced in May '09 from 34.5 mbps (and was 64 mbps in April '08).

The integrated throughput from **GES DISC** remains above the requirement, by more than 3x, so the rating remains "**Excellent**". The 1.2 mbps average user flow was below typical (but higher than last month's 0.9 mbps), and was only 4% of the reduced requirement (which includes reprocessing). Testing from **MODAPS-PDR** is similar to **GES DISC**. Performance from **EDOS**, and **ISIPS** remain lower than **GES DISC**.

JPL PODAAC → NSIDC S4PA: The requirement was reduced from 1.34 mbps in May '09. Throughput from PODAAC to NSIDC has been mostly stable since testing was moved to use Internet2 in September '09; the rating remains "**Excellent**". Performance improved in December '11 due to improved routing at FRGP.



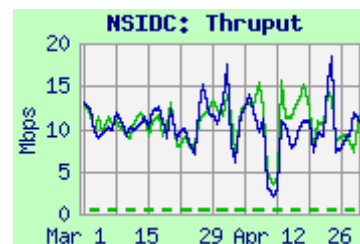
5) Boulder CO sites (Continued):

5.1) NSIDC: (Continued): Test Results: GHRC to NSIDC

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GHRC → NSIDC DAAC (nuttcp)	23.8	11.4	4.4
GHRC → NSIDC DAAC (ftp pull)	26.5	9.9	3.8

GHRC, GHRC-ftp → NSIDC S4PA: GHRC (NSSTC, UAH, Huntsville, AL)

sends AMSR-E data to NSIDC via NLR / Internet2. The rating is based on reverse nuttcp testing. The median nuttcp throughput is more than 3x the 0.5 mbps requirement, so the rating remains “**Excellent**”.

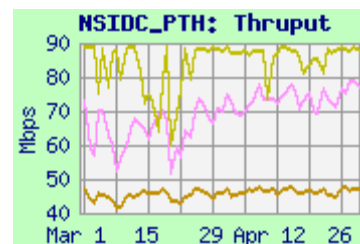
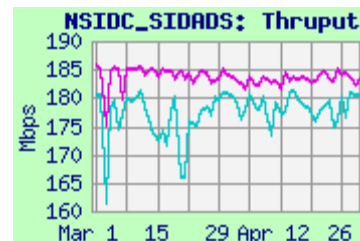


Test Results: NSIDC SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC-SIDADS	189.7	183.2	146.3
GSFC-NISN → NSIDC-SIDADS	181.1	178.4	159.6
ESDIS-PTH → NSIDC-PTH	80.4	73.4	58.2
MODAPS-PDR → NSIDC-PTH	51.7	46.6	41.6
JPL PTH → NSIDC-PTH	88.7	87.6	64.6

GSFC → NSIDC-SIDADS: The performance to SIDADS via NISN dropped in January (but note that the graph's scale is “expanded”) due to a NISN route change.

NSIDC-PTH: Thruput to NSIDC-PTH dropped from EBnet sources due to EBnet packet loss. Thruput from JPL was very steady. It has been requested to upgrade NSIDC-PTH from its Fast-E to a Gig-E interface.



5.2) LASP:

Ratings: GSFC ↔ LASP: Continued **Excellent**

Web Page: <http://ensight.eos.nasa.gov/Organizations/production/LASP.shtml>

Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ESDIS-PTH → LASP blue (iperf)	n/a	n/a	n/a
ESDIS-PTH → LASP blue (scp)	3.72	3.47	2.97
GES DISC → LASP blue (iperf)	6.59	5.68	3.90
LASP → GES DISC	9.34	9.34	8.53

Requirement:

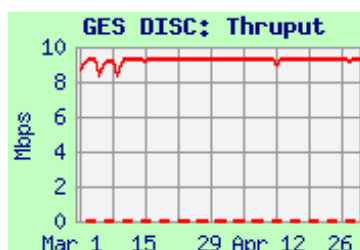
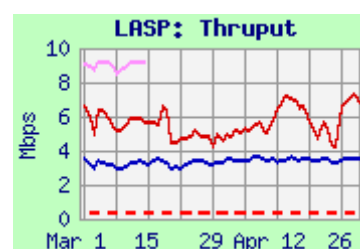
Source → Dest	Date	Mbps	Rating
LASP → GES DISC	CY '10 →	0.016	Excellent

Comments: In January '11, LASP's connection to NISN PIP was rerouted: it previously was 100 mbps from CU-ITS via NSIDC; this was changed to a 10 mbps connection to the NISN POP in Denver.

Thruput from GES DISC to LASP was mostly steady except for a drop in late February due to EBnet packet loss. Iperf testing from ESDIS-PTH to LASP was discontinued in March.

Testing was added in November from LASP to GES DISC based on the requirement for the SORCE mission for this flow. Thruput from LASP to GES DISC was very stable, and well over 3x the requirement, so the rating remains “**Excellent**”.

The average user flow from GSFC to LASP this month was close to normal at 50 kbps.



5) Boulder CO sites (Continued):

5.3) NCAR:

Ratings: LaRC → NCAR: Continued **Excellent**
 GSFC → NCAR: Continued **Excellent**

Web Pages <http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml>

Test Results:

Source	Medians of daily tests (mbps)			Requirement
	Best	Median	Worst	
LaRC PTH	188.4	161.1	95.0	0.1
GSFC-ENPL-10G	4401.3	1913.6	515.0	5.0
GSFC-ENPL-FE	98.9	97.9	85.3	
GSFC-NISN	487.5	289.4	120.8	

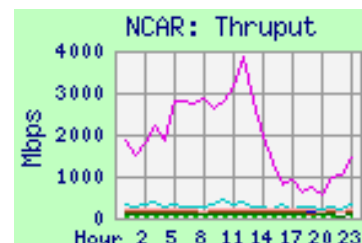
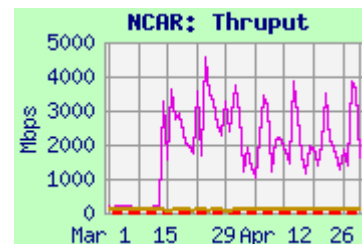
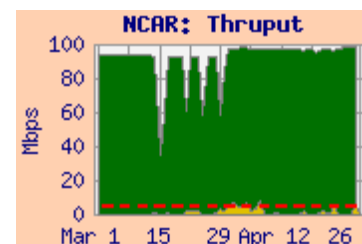
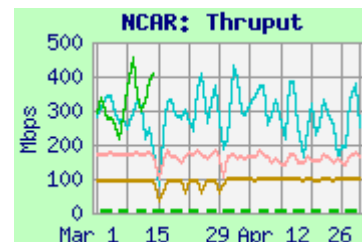
Comments: NCAR has a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS (Aura, from GSFC) QA requirements. NCAR is also connected to FRGP, but was not affected by the route changes in December '11 (which did affect NSIDC).

Testing was switched to NCAR's PerfSonar server on March 13 – discontinued testing from LaRC ASDC at that time; testing from LaRC-PTH continued. This node is 10 gigabit capable. Performance from most nodes was similar to the previous test node, but somewhat noisier.

From LaRC: Thruput from LaRC-PTH was well above 3 x the modest requirement, so the rating remains **Excellent**.

From GSFC: From GSFC-NISN, the route is via NISN to the MAX (similar route and performance as from LaRC ASDC). Thruput was also well above 3 x the requirement, so the rating remains **Excellent**. The average user flow from GSFC this month was 1.7 mbps, typical of recent months, with peaks about equal to the requirement.

From GSFC-ENPL-10G, with a 10 Gig-E interface, and a 10 gig connection to MAX, performance to NCAR's 10 Gig PerfSonar node gets over 4 gbps on peaks! However, significant diurnal variation is present, varying from a median of 4 gbps at 4 AM (Boulder time) to below 1 gbps at peak usage periods.



6) Remote Sensing Systems (RSS):

Ratings: JPL → RSS: Continued

Excellent

RSS → GHRC: Continued

Excellent

Web Page <http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml>

Test Results:

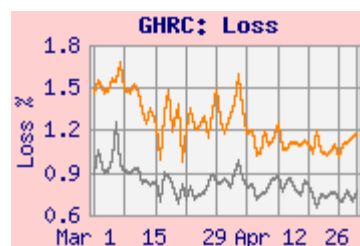
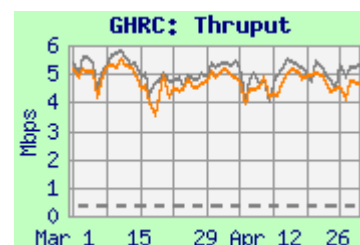
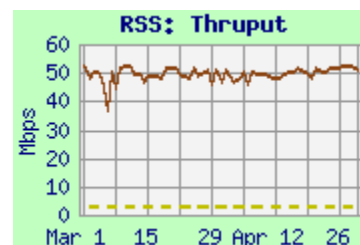
Source → Dest	Medians of daily tests (mbps)			Req
	Best	Median	Worst	
JPL → RSS (NISN)	n/a	n/a	n/a	0.49
JPL → RSS (Comcast)	52.1	50.0	34.8	
RSS (Comcast) → GHRC (UAH)	5.98	5.20	3.20	0.34
RSS (Comcast) → GHRC (NISN)	5.80	4.75	3.03	

Comments: RSS (Santa Rosa, CA) is a SIPS for AMSR-E (Aqua), receiving L1 data from JAXA via JPL, and sending its processed L2 results to GHRC (aka NSSTC) (UAH, Huntsville, AL).

At the end of March, RSS switched its production node from the NISN SIP circuit (4 x T1s to NASA ARC -- total 6 mbps) to the Comcast circuit, rated at 50 mbps incoming, and 12 mbps outgoing (installed in April 2011). Testing via NISN was discontinued at that time. Testing from JPL got much better results using the Comcast circuit than via NISN. The route from JPL is via CENIC, peering with Comcast in LA.

The requirement was reduced with handbook 1.4.3 (was 2.5 mbps previously). The median iperf was more than 3 x the reduced requirement, so the rating remains "Excellent".

RSS → GHRC: In addition, the new server at RSS connected to the Comcast circuit allows "3rd party testing", as does the server at GHRC. Testing has therefore been initiated from RSS to GHRC, with results around 5 mbps (after retuning in January), both to a UAH address and a NISN address at GHRC. Although packet loss is high, either result yields a rating of "Excellent" re the 0.34 mbps requirement.



7) Wisconsin:Web Pages <http://ensight.eos.nasa.gov/Missions/NPP/WISC.shtml>Rating: Continued **Good****Test Results:**

Source Node	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
NPP-SD3E	360.0	274.8	191.1	178.1	333.7
GSFC DISC	241.6	186.6	128.4		
GSFC ENPL	250.9	206.3	101.7		
LaRC ANGe	177.4	171.6	137.2		

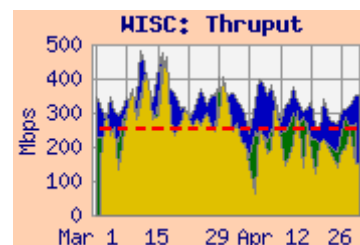
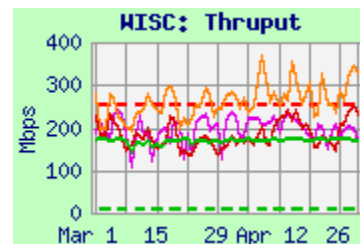
Requirements:

Source Node	FY	mbps	Rating
NPP-SD3E	'11 -	237.2	Good
GSFC DISC	'04 -	16.5	Excellent
GSFC Combined	'11 -	253.7	Good
LaRC Combined	'05 -	7.9	Excellent

Comments: The Univ of Wisconsin is included in this Production report due to its function as Atmosphere PEATE for NPP. Wisconsin continues to be an SCF on the MODIS, CERES and AIRS teams.

GSFC: Thruput dropped from all EBnet sources (NPP-SD3E, GES DISC) on 29 February due to EBnet outgoing packet loss. Even so, the integrated thruput was more than 30% above both the NPP and overall GSFC requirements, rating "Good". The rating from GES DISC was "Excellent", based on its lower requirement. From ENPL thruput was similar, and unaffected by the EBnet packet loss. User flow decreased, and is now a bit below the requirement. The route from GSFC is via MAX to Internet2, peering with MREN in Chicago.

LaRC: Thruput from LaRC ANGe is very steady and well above the requirement, rating "Excellent". The route from LaRC is via NISN, peering with MREN in Chicago.

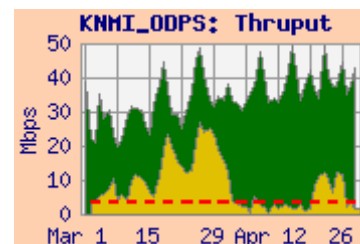
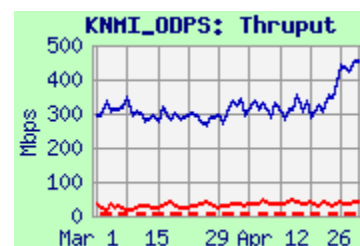
**8) KNMI:** Rating: Continued **Excellent**Web Pages http://ensight.eos.nasa.gov/Missions/aura/KNMI_ODPS.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			Reqmt
	Best	Median	Worst	
OMISIPS → KNMI-ODPS	51.5	36.2	23.8	0.03
GSFC-ENPL → KNMI-ODPS	592.2	325.9	215.3	

Comments: KNMI (DeBilt, Netherlands) is a SIPS and QA site for OMI (Aura). The route from GSFC is via MAX to Internet2, peering in DC with Géant's 10 gbps circuit to Frankfurt, then via Surfnet through Amsterdam.

The rating is based on the results from OMISIPS at GSFC to the ODPS primary server at KNMI. Thruput dropped on 29 February due to EBnet outgoing packet loss, but remained much more than the tiny requirement, so the rating remains "Excellent". Thruput was much higher from GSFC-ENPL (outside of EBnet).

The user flow increased, averaging a typical 4.8 mbps this month (was an unusually high 13.7 mbps last month). This is well above the previous 3.3 mbps requirement, and is much more than the current 0.03 mbps requirement (This new requirement remains under review). The rating would still be "Excellent" compared with the old 3.3 mbps requirement.



9) ERSDAC:

Ratings: **GSFC → ERSDAC:** Continued **Excellent**
ERSDAC → EROS: Continued **Excellent**
ERSDAC → JPL-ASTER-IST: Continued **Excellent**

Web Page: <http://ensight.eos.nasa.gov/Organizations/production/ERSDAC.shtml>

US ↔ ERSDAC Test Results

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-EDOS → ERSDAC	72.8	47.2	10.1	4.0	48.9
GES DISC → ERSDAC	40.2	32.1	23.3		
GSFC ENPL (FE) → ERSDAC	92.4	92.0	91.6		
GSFC ENPL (GE) → ERSDAC	619.5	528.9	333.5		
ERSDAC → EROS	127.1	95.9	57.0	3.7	96.3
ERSDAC → JPL-ASTER IST	68.1	60.9	49.7		

Requirements:

Source → Dest	FY	Mbps	Rating
GSFC → ERSDAC	'05 -	5.4	Excellent
ERSDAC → JPL-ASTER IST	'07 -	0.31	Excellent
ERSDAC → EROS	'07 -	8.3	Excellent

Comments:

GSFC → ERSDAC: As of approximately 1 September '11, the ERSDAC test node is connected at 1 gbps – formerly was 100 mbps. The median throughput from most nodes improved. A new test from GSFC ENPL was able to get average throughput over 500 mbps. However, some nodes have been using QoS (HTB) to reduce loss previously seen in the 1 gig to 100 meg switch at Tokyo-XP – those nodes remain limited by their HTB settings, and did not see much improvement.

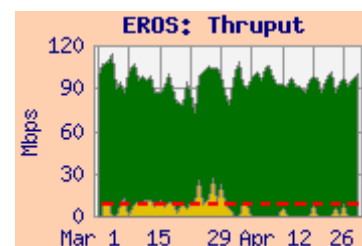
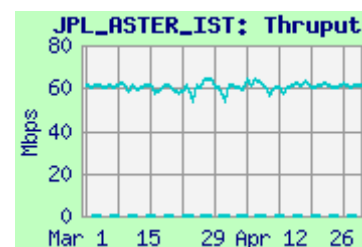
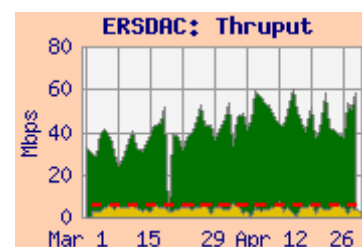
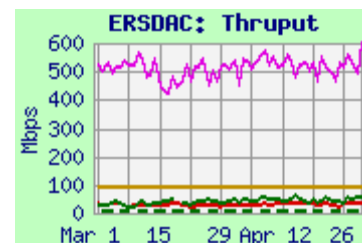
Throughput dropped from all EBnet sources (GSFC-EDOS, GES DISC) on 29 February due to EBnet outgoing packet loss. But throughput remains well above 3 x the reduced requirement, so the rating remains “Excellent”. The integrated chart shows that the user flow is mostly stable, and consistent with the requirement.

Throughput from GES DISC to ERSDAC did not improve with the Gig-E upgrade at ERSDAC. The GES DISC configuration is planned to be upgraded soon.

The FastE connected GSFC-ENPL-FE node is limited to 100 mbps by its own interface, and gets very steady throughput.

ERSDAC → JPL-ASTER-IST: The median throughput remains stable well above the [unstated] requirement (IST requirements are generally 311 kbps), so the rating remains “Excellent”.

ERSDAC → EROS: The throughput improved with retuning in mid October, after the ERSDAC Gig-E upgrade; it remains well above the reduced requirement (was 26.8 mbps previously). The user flow was near normal this month. The median throughput is more than 3 x the reduced requirement, so the rating remains “Excellent”.



10) US \leftrightarrow JAXA

Ratings: US \rightarrow JAXA: Continued **Excellent**
 JAXA \rightarrow US: Continued **Excellent**

The JAXA test hosts at EOC Hatoyama were retired on March 31, 2009 (the end of the Japanese government's fiscal year). No additional testing is planned for AMSR or TRMM. [All testing to JAXA-TKSC for ALOS was terminated at the end of June '09.](#)

However, the user flow between GSFC and JAXA continues to be measured. As shown below, the user flow this month averaged 2.26 mbps from GSFC to JAXA (with several peak periods over 4 mbps), and 63 kbps from JAXA to GSFC (with many peaks over 200 kbps). Comparing these values to the new requirement of 0.1 mbps produces a rating of "**Excellent**" in both directions. Note that the user flow to JAXA is much more consistent with the old 2.0 mbps GSFC \rightarrow JAXA requirement.

